

PUBLIC UTILITIES COMMISSION

505 VAN NESS AVENUE
SAN FRANCISCO, CA 94102-3298



November 10, 2011

Advice Letters 3508-E-A and 3508-E-B

Brian K. Cherry
Vice President, Regulation and Rates
Pacific Gas and Electric Company
77 Beale Street, Mail Code B10C
P.O. Box 770000
San Francisco, CA 94177

**Subject: Supplemental Filings – Revisions to Electric Rule 21 – Generating
Facility Interconnections, Section D**

Dear Mr. Cherry:

Advice Letters 3508-E-A and 3508-E-B are effective September 22, 2011 per
Resolution E-4411.

Sincerely,

A handwritten signature in cursive script that reads "Edward F. Randolph".

Edward F. Randolph, Director
Energy Division



Brian K. Cherry
Vice President
Regulation and Rates

Pacific Gas and Electric Company
77 Beale St., Mail Code B10C
P.O. Box 770000
San Francisco, CA 94177

Fax: 415.973.6520

October 17, 2011

Advice 3508-E-B

(Pacific Gas and Electric Company ID U 39 E)

Public Utilities Commission of the State of California

Subject: Modifications to Electric Rule 21 Pursuant to Resolution E-4411

Purpose

Pursuant to Resolution E-4411 issued September 22, 2011, Pacific Gas and Electric Company ("PG&E") submits this advice letter and revisions to its electric tariffs to modify Electric Rule 21 - *Generating Facility Interconnections*. The affected tariff sheets are listed on the enclosed Attachment 1.

Background

On August 18, 2009, PG&E submitted Advice ("AL") 3508-E proposing two revisions to Electric Rule 21 – *Generating Facility Interconnections*, Section D. First, PG&E proposed to base the requirement for a dedicated distribution transformer, when interconnecting a 20 kilovolt-ampere ("kVA") or larger photovoltaic generator, on an engineering evaluation of the existing transformer's capacity rather than requiring one in all cases. Second, PG&E proposed to clarify voltage requirements consistency with Electric Rule 2 - *Description of Service*.

After a round of protests and responses, PG&E agreed to work with protesting parties, the other Utilities (Southern California Edison and San Diego Gas and Electric) and the Energy Division to come up with mutually acceptable language. On March 28, 2011, PG&E submitted supplemental AL 3508-E-A.

On September 22, 2011, after additional changes were agreed upon by the parties mentioned above, Resolution E-4411 ("Resolution") was issued. Because all of the Utilities did not submit a supplemental advice letter in March 2011 and the Resolution dealt broadly with all changes requested since the original 2009 advice letters, some changes the Resolution ordered had already been made by PG&E in its March 28, 2011, AL 3508-E-A. Since the Resolution stated, "These revisions to Tariff Rule 21 are effective as of the effective date of this Resolution," and some of the pressing customer

issues were addressed in AL 3508-E-A (specifically, the change where section D.3.d is replaced by Sections D.1.e and D.1.f, which deals with transformer change-outs requirements for generating facilities), PG&E assumes this language that was already included in AL 3508-E-A is effective September 22, 2011, the effective date of Resolution E-4411. This Advice Letter addresses the remaining issues ordered as called out in Appendix A of Resolution E-4411.

Tariff Revisions

1. In AL 3508-E-A, PG&E already made the first change requested in Appendix A of Resolution E-4411, which orders that Section D.3.d be replaced with new Sections D.1.e. and D.1.f.to read:

D.1.e. The maximum aggregated Gross Ratings for all the Generating Facilities connected to a secondary distribution transformer shall not exceed the transformer rating modified per established utility practice absent any customer generators. When PG&E's analysis determines a transformer change is required, PG&E will furnish the customer with an explanation of why the change is needed.

D.1.f. Generating facilities connected to a single-phase transformer with 120/240 volt secondary voltage must be installed such that the aggregated gross output is as balanced as practicable between the two phases of the 240 volt service. When PG&E's analysis determines a transformer change is required, PG&E will furnish the customer with an explanation of why the change is needed."

2. Section D.2.b title is changed to " Voltage Trip Settings."
3. Section D.2.b.1 is modified to read:

Generating Facilities (30 kVA or less). Generating Facilities with a Gross Rating of 30 kVA or less shall be capable of operating within the voltage range normally experienced on PG&E's Distribution System from plus to minus 5% of the nominal voltage (e.g. 114 volts to 126 volts, on a 120 volt base), at the service panel or PCC. The trip settings at the generator terminals may be selected in a manner that minimizes nuisance tripping between 106 volts and 132 volts on a 120-volt base (88%-110% of nominal voltage) to compensate for voltage drop between the generator terminals and the PCC. Voltage may be detected at either the PCC or the Point of Interconnection. However, the voltage range at the PCC, with the generator on-line, shall stay within +/- 5% of nominal.

4. Section D.2.b.2 is modified to read:

Generating Facilities (greater than 30 kVA). PG&E may have specific operating voltage ranges for Generating Facilities with Gross Ratings greater than 30 kVA, and may require adjustable operating voltage settings. In the absence of such requirements, the Generating Facility shall be capable of operating at a range between 88% and 110% of the applicable interconnection voltage. Voltage shall be detected at either the PCC or the Point of Interconnection, with settings compensated to account for the voltage at the PCC. However, the voltage range at the PCC, with the generator on-line, shall stay within +/-5% of nominal.

5. The title for Table D.1 is changed to "Voltage Trip Settings for Generating Facilities" and the heading of the voltage range columns is changed to "Voltage at Point of Common Coupling (the Ranges Below Are Used to Trip the Generating Facility During Abnormal Distribution System Conditions)."

6. In Table D.1, delete the row starting with "Greater than or equal to 106 Volts but less than or equal to 132 Volts." This change was already made in AL 3508-E-A.

7. In Table D.1, move the last sentence of Footnote 1 and make it a separate footnote (Footnote 2) to the title of Table D.1 to read:

For Generating Facilities with a rating greater than 30 kVA, set points shall be field adjustable and different voltage set points and trip times from those in Table D.1 may be negotiated with PG&E.

8. Section D.2.i is modified to read:

Power Factor: The Producer shall provide adequate reactive power compensation on site to maintain the generating facility power factor near unity at rated output or a PG&E specified power factor within a power factor range from 0.9 leading to 0.9 lagging, based on local system conditions. While not required, for generators that do not have inherent reactive power control capability, PG&E may offer reactive power support in the form of power factor correction capacitors on its distribution system, under a Special Facilities agreement, as described in section E.3.a or Rule as applicable.

9. Throughout Rule 21 replace the term, "Gross Nameplate Rating" with "Gross Rating" and replace the term "Net Nameplate Rating" with "Net Rating" and correct other minor formatting and terminology errors.

Protests

Anyone wishing to protest this filing may do so by letter sent via U.S. mail, by facsimile or electronically, any of which must be received no later than **November 7, 2011**, which is 21 days after the date of this filing.* Protests should be mailed to:

CPUC Energy Division
Tariff Files, Room 4005
DMS Branch
505 Van Ness Avenue
San Francisco, California 94102

Facsimile: (415) 703-2200
E-mail: jnj@cpuc.ca.gov and mas@cpuc.ca.gov

Copies of protests also should be mailed to the attention of the Director, Energy Division, Room 4004, at the address shown above.

The protest also should be sent via U.S. mail (and by facsimile and electronically, if possible) to PG&E at the address shown below on the same date it is mailed or delivered to the Commission:

Brian K. Cherry
Vice President, Regulation and Rates
Pacific Gas and Electric Company
77 Beale Street, Mail Code B10C
P.O. Box 770000
San Francisco, California 94177

Facsimile: (415) 973-6520
E-mail: PGETariffs@pge.com

Effective Date

PG&E requests that this Tier 1 advice filing become effective on **September 22, 2011**, which is the effective date for Resolution E-4411.

Notice

In accordance with General Order 96-B, Section IV, a copy of this advice letter is being sent electronically and via U.S. mail to parties shown on the attached list and the parties on the service lists for R.10-05-004 and A.10-03-001. Address changes to the General

* Since the protest period ends on a weekend, PG&E is moving the end of the protest period to the following business day.

Order 96-B service list should be directed to PG&E at e-mail address PGETariffs@pge.com. For changes to any other service list, please contact the California Public Utilities Commission's Process Office at (415) 703-2021 or at Process_Office@cpuc.ca.gov. Send all electronic approvals to PGETariffs@pge.com. Advice letter filings can also be accessed electronically at: <http://www.pge.com/tariffs>

Handwritten signature of Brian Cheng in cursive script.

Vice President - Regulation and Rates

cc: Service Lists R.10-05-004 and A.10-03-001

Attachments

CALIFORNIA PUBLIC UTILITIES COMMISSION

ADVICE LETTER FILING SUMMARY

ENERGY UTILITY

MUST BE COMPLETED BY UTILITY (Attach additional pages as needed)

Company name/CPUC Utility No. **Pacific Gas and Electric Company (ID U39 M)**

Utility type:

ELC

GAS

PLC

HEAT

WATER

Contact Person: Linda Tom-Martinez

Phone #: (415) 973-4612

E-mail: lmt1@pge.com

EXPLANATION OF UTILITY TYPE

ELC = Electric

GAS = Gas

PLC = Pipeline

HEAT = Heat

WATER = Water

(Date Filed/ Received Stamp by CPUC)

Advice Letter (AL) #: **3508-E-B**

Tier: **1**

Subject of AL: **Modifications to Electric Rule 21 Pursuant to Resolution E-4411**

Keywords (choose from CPUC listing): Compliance, Text Changes

AL filing type: Monthly Quarterly Annual One-Time Other _____

If AL filed in compliance with a Commission order, indicate relevant Decision/Resolution #: Resolution E-4411

Does AL replace a withdrawn or rejected AL? If so, identify the prior AL: No

Summarize differences between the AL and the prior withdrawn or rejected AL¹: _____

Is AL requesting confidential treatment? If so, what information is the utility seeking confidential treatment for: Confidential information will be made available to those who have executed a nondisclosure agreement: Yes No

Name(s) and contact information of the person(s) who will provide the nondisclosure agreement and access to the confidential information: _____

Resolution Required? Yes No

Requested effective date: **September 22, 2011**

No. of tariff sheets: 6

Estimated system annual revenue effect (%): N/A

Estimated system average rate effect (%): N/A

When rates are affected by AL, include attachment in AL showing average rate effects on customer classes (residential, small commercial, large C/I, agricultural, lighting).

Tariff schedules affected: Electric Rule 21

Service affected and changes proposed¹: N/A

Pending advice letters that revise the same tariff sheets: N/A

Protests, dispositions, and all other correspondence regarding this AL are due no later than 20 days after the date of this filing, unless otherwise authorized by the Commission, and shall be sent to:

CPUC, Energy Division

Tariff Files, Room 4005

DMS Branch

505 Van Ness Ave.,

San Francisco, CA 94102

jnj@cpuc.ca.gov and mas@cpuc.ca.gov

Pacific Gas and Electric Company

Attn: Brian Cherry

Vice President, Regulation and Rates

77 Beale Street, Mail Code B10C

P.O. Box 770000

San Francisco, CA 94177

E-mail: PGETariffs@pge.com

**ATTACHMENT 1
Advice 3508-E-B**

**Cal P.U.C.
Sheet No.**

Title of Sheet

**Cancelling Cal
P.U.C. Sheet No.**

30190-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 14	23689-E
30191-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 15	
30192-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 16	23690-E
30193-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 17	23691-E
30195-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 19	23693-E
30197-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 21	



ELECTRIC RULE NO. 21
GENERATING FACILITY INTERCONNECTIONS

Sheet 14

- D. GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (T)
 (Cont'd.) (T)
- 1. GENERAL INTERCONNECTION AND PROTECTIVE FUNCTION REQUIREMENTS (CONT'D.)
 - e. The maximum aggregated Gross Ratings for all the Generating Facilities connected to a secondary distribution transformer shall not exceed the transformer rating modified per established utility practice absent any customer generators. When PG&E's analysis determines a transformer change is required, PG&E will furnish the customer with an explanation of why the change is needed. (N)
 - f. Generating facilities connected to a single-phase transformer with 120/240 volt secondary voltage must be installed such that the aggregated gross output is as balanced as practicable between the two phases of the 240 volt service, consistent with Electric Rule 2.D.4. When PG&E's analysis determines a transformer change is required, PG&E will furnish the customer with an explanation of why the change is needed. (N)
 - g. Drawings Required. Prior to Parallel Operation or Momentary Parallel Operation of the Generating Facility, PG&E shall approve the Producer's Protective Function and control diagrams. Generating Facilities equipped with a Protective Function and control scheme previously approved by PG&E for system-wide application or only Certified Equipment may satisfy this requirement by reference to previously approved drawings and diagrams. (T)
 - h. Generating Facility Conditions Not Identified. In the event this Rule does not address the Interconnection conditions for a particular Generating Facility, PG&E and Producer may agree upon other arrangements. (T)
 (L)

(Continued)



ELECTRIC RULE NO. 21
GENERATING FACILITY INTERCONNECTIONS

Sheet 15

D. GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (N)

2. PREVENTION OF INTERFERENCE (L)

The Producer shall not operate Generating or Interconnection Facilities that superimpose a voltage or current upon PG&E's Distribution System that interferes with PG&E operations, service to PG&E customers, or communication facilities. If such interference occurs, the Producer must diligently pursue and take corrective action at its own expense after being given notice and reasonable time to do so by PG&E. If the Producer does not take corrective action in a timely manner, or continues to operate the facilities causing interference without restriction or limit, PG&E may, without liability, disconnect the Producer's facilities from PG&E's Distribution System, in accordance with Section B.9 of this Rule. To eliminate undesirable interference caused by its operation, each Generating Facility shall meet the following criteria:

- a. Voltage Regulation. The Generating Facility shall not actively regulate the voltage at the PCC while in parallel with PG&E's Distribution System. The Generating Facility shall not cause the service voltage at other customers to go outside the requirements of ANSI C84.1-1995, Range A (IEEE 1547-4.1.1).
- b. Voltage Trip Settings. The voltage ranges in Table D.1 define protective trip limits for the Protective Function and are not intended to define or imply a voltage regulation Function. Generating Facilities shall cease to energize PG&E's Distribution System within the prescribed trip time whenever the voltage at the PCC deviates from the allowable voltage operating range. The Protective Function shall detect and respond to voltage on all phases to which the Generating Facility is connected. (D)/(N) (L)

(Continued)



ELECTRIC RULE NO. 21
GENERATING FACILITY INTERCONNECTIONS

Sheet 17

- D. GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (CONT'D.) (T) (L)
2. PREVENTION OF INTERFERENCE (Cont'd.)
- b. Voltage Trip Settings (Cont'd.) (D)/(N)

Table D.1: Voltage Trip Settings for Generating Facilities ⁽²⁾			
Voltage at Point of Common Coupling (The Ranges Below Are Used to Trip the Generator During Abnormal Distribution System Conditions)		Maximum Trip Time ⁽¹⁾	
Assuming 120 V Base	% of Nominal Voltage	# of Cycles (Assuming 60 Hz Nominal)	Seconds
Less than 60 Volts	Less than 50%	10 Cycles	0.16 Seconds
Greater than or equal to 60 Volts but less than 106 Volts	Greater than or equal to 50% but less than 88%	120 Cycles	2 Seconds
Greater than 132 Volts but less than or equal to 144 Volts	Greater than 110% but less than or equal to 120%	60 Cycles	1 Second
Greater than 144 Volts	Greater than 120%	10 Cycles	0.16 Seconds

- ⁽¹⁾ "Maximum Trip time" refers to the time between the onset of the abnormal condition and the Generating Facility ceasing to energize PG&E's Distribution System. Protective Function equipment and circuits may remain connected to PG&E's Distribution System to allow sensing of electrical conditions for use by the "reconnect" feature. The purpose of the allowed time delay is to allow for a Generating Facility to minimize tripping during short-term system disturbances. Set points shall not be user adjustable for generating facilities less than 30 kW. (D) (D)/(N) (D) (L)
- ⁽²⁾ For Generating Facilities with a rating greater than 30 kVA, set points shall be field adjustable and different voltage set points and trip times from those in Table D.1 may be negotiated with PG&E. (N) (N)

(Continued)



ELECTRIC RULE NO. 21
GENERATING FACILITY INTERCONNECTIONS

Sheet 19

- D. GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (T) (L)
2. PREVENTION OF INTERFERENCE (Cont'd.) (T)
- f. Frequency. (Cont'd.)

Table D.2: Frequency Trip Settings		
Generating Facility Rating	Frequency Range (Assuming 60 Hz Nominal)	Maximum Trip Time ⁽¹⁾ (Assuming 60 Cycles per Second)
Less or equal to 30 kW	Less than 59.3 Hz	10 Cycles
	Greater than 60.5 Hz	10 Cycles
Greater than 30 kW	Less than 57 Hz	10 Cycles
	Less than an adjustable value between 59.8 Hz and 57 Hz but greater than 57 Hz ²	Adjustable between 10 and 18,000 Cycles ^{2,3}
	Greater than 60.5 Hz	10 Cycles

- (1) "Maximum Trip time" refers to the time between the onset of the abnormal condition and the Generating Facility ceasing to energize PG&E's Distribution System. Protective Function sensing equipment and circuits may remain connected to PG&E's Distribution System to allow sensing of electrical conditions for use by the "reconnect" feature. The purpose of the allowed time delay is to allow a Generating Facility to "ride through" short-term disturbances to avoid nuisance tripping. Set points shall not be user adjustable (though they may be field adjustable by qualified personnel). For Generating Facilities with a Gross Rating greater than 30 kVA, set points shall be field adjustable and different voltage set points and trip times from those in Table D.2 may be negotiated with PG&E. (D)
- (2) Unless otherwise required by PG&E, a trip frequency of 59.3 Hz and a maximum trip time of 10 cycles shall be used.
- (3) When a 10-cycle maximum trip time is used, a second under frequency trip setting is not required. (L)

(Continued)



ELECTRIC RULE NO. 21
GENERATING FACILITY INTERCONNECTIONS

Sheet 21

- D. GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (N)
- 2. PREVENTION OF INTERFERENCE (Cont'd.) (N)
 - h. Direct Current Injection. Generating Facilities should not inject direct current greater than 0.5% of rated output current into PG&E's Distribution System. (L)
 - i. Power Factor. The Producer shall provide adequate reactive power compensation on site to maintain the generating facility power factor near unity at rated output or a PG&E specified power factor within a power factor range from 0.9 leading to 0.9 lagging, based on local system conditions. While not required, for generators that do not have inherent reactive power control capability, PG&E may offer reactive power support in the form of power factor correction capacitors on its distribution system under a Special Facilities agreement as described in Section E.3.a or Rule 2.1 as applicable. (N)

(Continued)

**PG&E Gas and Electric
Advice Filing List
General Order 96-B, Section IV**

AT&T	Dept of General Services	Northern California Power Association
Alcantar & Kahl LLP	Douglass & Liddell	Occidental Energy Marketing, Inc.
Ameresco	Downey & Brand	OnGrid Solar
Anderson & Poole	Duke Energy	Praxair
Arizona Public Service Company	Economic Sciences Corporation	R. W. Beck & Associates
BART	Ellison Schneider & Harris LLP	RCS, Inc.
Barkovich & Yap, Inc.	Foster Farms	Recurrent Energy
Bartle Wells Associates	G. A. Krause & Assoc.	SCD Energy Solutions
Bloomberg	GLJ Publications	SCE
Bloomberg New Energy Finance	GenOn Energy, Inc.	SMUD
Boston Properties	Goodin, MacBride, Squeri, Schlotz & Ritchie	SPURR
Braun Blasing McLaughlin, P.C.	Green Power Institute	San Francisco Public Utilities Commission
Brookfield Renewable Power	Hanna & Morton	Seattle City Light
CA Bldg Industry Association	Hitachi	Sempra Utilities
CLECA Law Office	In House Energy	Sierra Pacific Power Company
CSC Energy Services	International Power Technology	Silicon Valley Power
California Cotton Ginners & Growers Assn	Intestate Gas Services, Inc.	Silo Energy LLC
California Energy Commission	Lawrence Berkeley National Lab	Southern California Edison Company
California League of Food Processors	Los Angeles Dept of Water & Power	Spark Energy, L.P.
California Public Utilities Commission	Luce, Forward, Hamilton & Scripps LLP	Sun Light & Power
Calpine	MAC Lighting Consulting	Sunshine Design
Cardinal Cogen	MBMC, Inc.	Sutherland, Asbill & Brennan
Casner, Steve	MRW & Associates	Tabors Caramanis & Associates
Chris, King	Manatt Phelps Phillips	Tecogen, Inc.
City of Palo Alto	McKenzie & Associates	Tiger Natural Gas, Inc.
City of Palo Alto Utilities	Merced Irrigation District	TransCanada
City of San Jose	Modesto Irrigation District	Turlock Irrigation District
Clean Energy Fuels	Morgan Stanley	United Cogen
Coast Economic Consulting	Morrison & Foerster	Utility Cost Management
Commercial Energy	NLine Energy, Inc.	Utility Specialists
Consumer Federation of California	NRG West	Verizon
Crossborder Energy	NaturEner	Wellhead Electric Company
Davis Wright Tremaine LLP	Navigant Consulting	Western Manufactured Housing Communities Association (WMA)
Day Carter Murphy	Norris & Wong Associates	eMeter Corporation
Defense Energy Support Center	North America Power Partners	
Department of Water Resources	North Coast SolarResources	